

DRN-3100 dynamically builds and maintains routing tables identifying resources and resource locations on all connected Ethernets. When a message on one Ethernet is destined for a node on a different Ethernet, the bridge passes the message on to the destination network transparently to the user.

The DRN-3100 dedicates separate 68000 microprocessors with dynamic RAM to each Ethernet for code/message buffering. It efficiently handles message routing and data movement between networks at high throughput.

The DRN-3200 DDN/Ethernet Gateway is a high-performance network node which gives Ethernet-TCP/IP users access to the resources of the Defense Data Network (DDN), ARPAnet, or compatible networks. Messages from either DDN or Ethernet are addressed to the DRN-3200, which reformats the communication for transmission over the other network.

The Exterior Gateway Protocol (EGP) maintains routing tables and communicates with other known gateways to manage routing information. The Internet Protocol uses the routing tables to determine the next stop to the message's final destination.

The DRN-3300 X.25/Ethernet Gateway is a high-performance network node which gives Ethernet users access to the resources of X.25 packet switching networks. Messages from either the network or Ethernet are addressed to the DRN-3300, which reformats the communication for transmission over the other network.

All DRNs are designed to accommodate large networks, where management, software upgrades, and fault isolation are significant logistics problems. Each DRN contains a maintenance facility supporting network-based monitoring, download, traffic generation, diagnostic self-testing, and, by traffic analysis, isolation of local network backbone failure.

DRN-1700 LanScan Ethernet Monitor

"SNITFOL"

The DRN-1700 LanScan Ethernet Monitor is a high-performance, versatile, and adaptive tool for network managers and network system developers. It attaches to an Ethernet cable and monitors traffic on the network and provides statistical information on the network's reliability. In addition to its monitoring functions, the LanScan provides a complete testing facility which is capable of assessing the general integrity of the network, as well as pinpointing specific stations on the network which may be generating errors. The monitor also supplies a means of debugging protocol-related problems through viewing network activity at the line-level.

The user controls the LanScan by entering commands at a dedicated terminal keyboard, with most commands requiring only a single keystroke. Command entry is simplified by the use of a standard set of dedicated function keys and screens with fixed menu layouts. Each menu screen displays a number of parameters,

some of which may be changed. Modifiable parameters are indicated through highlighting.

User options include the ability to designate names to represent station Ethernet addresses, so that in subsequent references the stations are denoted by names rather than by multi-digit addresses.

A printer may be attached to the LanScan's printer port in order to provide hardcopy of statistical information, test specifications, test results, and station address/name tables.

The LanScan consists of two modules: a network unit and a terminal. The network unit provides the interface to the Ethernet and performs all the data capture and formatting functions. The Terminal supplies a high-quality display screen with a separate keyboard. An interface cable connects the Terminal to the Network Unit.

The LanScan may be set to operate in any one of five "modes."

Statistics Mode - In Statistics Mode, the system displays a count of all packets sent and received, together with byte counts for every machine on the network. It also shows the number of bad packets sent by each station, which is invaluable information for measuring the reliability of the network.

The Statistics Mode is somewhat different from the other modes in that rather than causing the monitor to perform a different function, selecting it causes the monitor to display statistics that it collects at all times no matter for which mode it is set -- in other words, for as long as the Monitor is connected to the network and switched on, it collects the following information for all stations on the network: Packets Sent -- the number of packets transmitted by the station; Packets in Error -- the number of packets sent by the station which are in error when received by the monitor; erroneous packets are those with alignment errors (i.e., whose length is not a multiple of 8 bits), CRC errors, or packets that are too short (less than 60 bytes) (note that a marginal packet might appear erroneous to the monitor, but be received correctly by the target station); Packets Received -- the number of (good) packets received by the station; Bytes Transmitted -- the number of bytes in packets transmitted by the station; and Bytes Received -- the number of bytes in packets received by the station.

Performance Mode - In Performance Mode, the system measures the intensity of each station's use of the network and also indicates total network usage. Data is presented both numerically and graphically, giving an instant picture of network activity.

Test Mode - In Test Mode, the LanScan uses a Time Domain Reflectometer (TDR) function to identify where on the cable a fault (either short or open circuit) has occurred. If the network seems intact but there is doubt as to whether two stations can communicate, the Monitor performs further tests

designed to locate the error(s).

To do this, the Monitor sends either of two kinds of test packets: ISO or XNS. The Monitor sends both types of packets, in order to accommodate both machines which use the ISO test mechanism, as well as those which support XNS.

The Monitor performs the second set of tests by acting as a Configuration Test Server, as defined by Xerox in the Ethernet specification: in this role, it sends test packets to stations on the network and watches for echoed replies; if there is no reply from a station, it sends an ISO test packet according to the IEEE 802.2 specifications, and waits, once more, for a response.

During the running of this test, progress and error messages are output to the terminal screen.

Development Mode - In Development Mode, the Monitor provides a sophisticated set of packet tracing facilities which allow network failures caused by incorrect protocol software to be readily identified. It operates by capturing data that matches PATTERNS defined by the user. The user may thereby set up trace conditions which filter out only those packets which the user believes to be causing a problem, and he or she can "trigger" the data capture to begin when some other event (also defined by the user) is detected on the line.

In addition, the user may specify that the LanScan START, CENTER, STOP, or START CONTINUOUS trace at the triggering event: START means that the LanScan will capture data which follows the triggering event, and that the data will be held in store for the user to scroll through and analyze; CENTER causes the LanScan to capture half of its data before the triggering event and half of its data after the triggering event, and to hold the data in store for the user to scroll through and analyze; STOP specifies that the monitor capture data until the triggering condition is detected, and then to hold the data in store for the user to scroll through and analyze; and START CONTINUOUS causes the monitor to display data packets which follow the triggering event immediately upon capturing them, and then to discard them -- in other words, packets simply scroll off the screen.

The Monitor also presents the packet data to the user in an appropriate form, by means of a parameter that allows the user to specify the family of protocol he or she is using (ISO, XNS, IP, or HEX); the Monitor then automatically interprets packets according to that protocol. If the HEX protocol is selected, all data in the packets is represented as Hex bytes; there is no protocol interpretation.

Traffic Generation Mode - Traffic Generation Mode allows the user to generate traffic on the network and subsequently to monitor the number of packets sent, collisions detected, and transmissions deferred.

Pricing

Quantity-one prices for CMC Networking products are listed below. Substantial discounts are available in most cases for quantity purchases.

<u>Model</u>	<u>Description</u>	<u>Price</u>
DRN-1100	Ethernet Terminal Server	\$ 5,490
DRN-1700	LanScan Ethernet Monitor	8,500
DRN-2100	DDN Terminal Server	10,990
DRN-3100	Ethernet to Ethernet Gateway	6,990
DRN-3200	Ethernet to DDN Gateway	11,900
DRN-3300	Ethernet to X.25 Gateway	7,990
TCP/IP	Internet Software for UNIX V	600 - 1,000
TCP/IP	Internet Software for VMS	2,500 - 6,000
TCP/IP	Internet Software for PC DOS	350
XNS	Xerox Network Software for UNIX	1,200
	Ethernet Baseband Transceiver	300

Conclusion

As the local network market expands and network users become more sophisticated, they also become more demanding. CMC has expanded its product line over the past five years to meet these increasing demands. Describing itself as a "total communications solutions" company, CMC now offers a broad line of local network products.

CMC addresses the interconnection of diverse machines and operating systems with systems and bus attach level interfaces. The systems incorporate standard RS-232-C/449 electrical interfaces for moderate speed attachments to the network. The Node Processors incorporate standard buses that allow high-speed attachments to the network.

In addition to its Distributed Resource Node and Ethernet Node Processor products, CMC offers baseband transceivers and Ethernet broadband modems to allow users a choice of media. In February, it announced the availability of what it believes to be the industry's first video multiplexer, allowing local video sources and data signals to be transmitted simultaneously over Ethernet baseband networks. Designated EtherVideo, the video multiplexer accepts both baseband and composite video-audio signals and linearly modulates them to any user-selected RF carrier in the UHF frequency spectrum (470 MHz to 770 MHz). The modulated signal is then passed through an isolating combiner where it is merged with data transmission onto the Ethernet without disturbing the normal Ethernet data.

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